Health by Numbers

Rhode Island Department of Health
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Vol. 4, No. 9 September 2002 Edited by Jay S. Buechner, PhD

Trends and Patterns in Place of Death, 1989-2000

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Over the past decade, there has been a substantial change in the pattern of places where death occurs in Rhode Island, with a rapidly growing proportion of deaths occurring in nursing homes. Indeed, for this particular setting, sufficient interest has arisen in the circumstances surrounding death to generate a recent research study in Rhode Island based on surveys of decedents' next of kin.[1] The work presented here draws from information reported on death certificates to document changes in the pattern over time and for some of the observed changes proposes possibly explanatory causes in the underlying medical care system.

Methods. Data on deaths occurring in Rhode Island during the period 1989-2000 were extracted from the Vital Statistics death certificate database. Data items on the decedent's place of death (home, nursing home, specific hospital, etc.) and, for hospital deaths, the hospital status of the decedent (inpatient, emergency department, dead on arrival, etc.) were combined to form a single characterization of place of death used in the analysis. Hospitals were characterized as either acute care, including primarily the state's private facilities, or long-term, including primarily facilities owned by state or federal government.

Decedents were also grouped according to underlying causes of death, as coded in the International Classification of Diseases, Ninth Revision (used for deaths during 1989–1998) or Tenth Revision (used for deaths during 1999-2000). Four leading cause of death groups were examined separately. (Table 1)

Table 1. Definitions of Selected Cause of Death Groups in International Classification of Diseases (ICD) Codes[2,3]

Cause of Death	ICD-9 (1989-1998)	ICD-10 (1999-2000)
Heart Disease	390-398, 402, 404-429	I00-I09, I11, I13, I20-I51
Cancer	140-208	C00-C97
Stroke	430-438	I60-I69
Injuries and Adverse Effects	800-999	V01-V99, X01-X99, Y01-Y89

Results. Over the twelve-year period examined, an average of 9,751 deaths occurred in Rhode Island annually, ranging between 9,481 (1994) and 10,142 (2000). During 2000, the most commonly reported places of death were nursing homes (35.1%), inpatient settings in acute care hospitals (28.6%), and the decedent's own home (17.2%). (Figure 1) Smaller proportions died in acute care hospital emergency departments (8.1%), en route to emergency care (1.9%), or in long-term hospitals (1.5%). The numbers of deaths in the two acute care hospital settings may be understated because of the substantial number of deaths reported as occurring in acute care hospitals without information on the specific setting (5.3%). For some decedents (2.3%), the place of death was either not provided on the death certificate or could not be coded to one of the choices available.

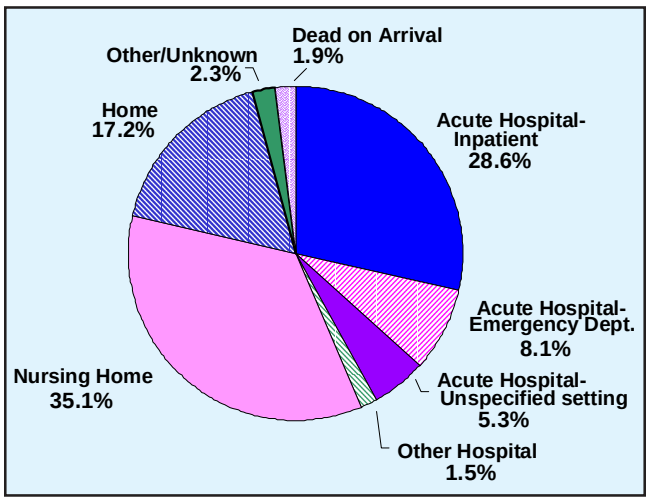

Figure 1. Place of Death, Deaths Occurring in Rhode Island, 2000.

In the early part of the period, the largest number of deaths occurred in the acute care hospital inpatient setting (36.7% in 1989), followed by nursing homes (20.1%) and the decedent's home (17.4%). Smaller numbers died in acute care hospital emergency departments (7.0%) and in long-term hospitals (3.6%) or died before they could reach medical treatment (3.3%). The remaining deaths occurred in unspecified settings in acute care hospitals (9.6%) or in some other or unknown place (2.4%).

Over time the proportion of deaths among inpatients in acute care hospitals declined and the proportion in nursing homes rose, so that by 1995 the most common place of death in the state became the nursing home. (Figure 2) Over the same period, the number of

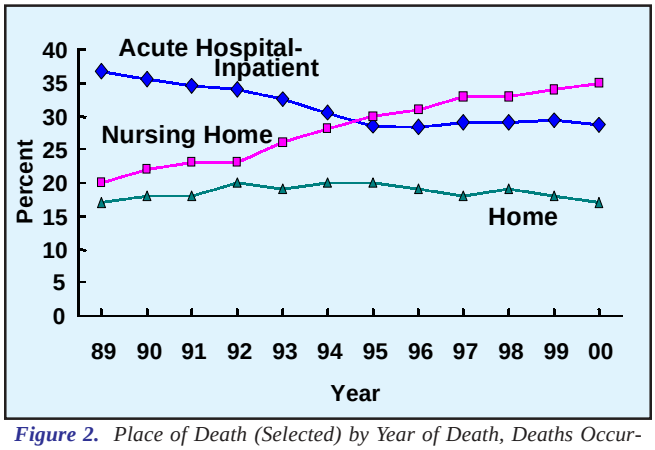

Figure 2. Place of Death (Selected) by Year of Death, Deaths Occurring in Rhode Island, 1989-2000.

deaths in long-term hospitals fell also, by more than half. The number of deaths in hospital emergency departments rose slightly, while the proportion of decedents who died en route to emergency care fell. The number of decedents dying in their own homes remained virtually constant over the period.

Place of death varied according to the underlying cause of death, with noticeable differences among the patterns for the leading chronic diseases, as well as between chronic diseases and injuries. (Figure 3) Although the proportion dying in nursing homes was substantial for all three of the leading chronic diseases, ranging from 33.9% to 50.1%, the proportion dying in their homes varied from 4.6% for stroke victims to 31.3% for cancer victims. The pattern for injury victims was unique, with the greatest number (30.6% of all decedents) dying while in acute care hospital emergency departments and few (2.2%) dying in nursing homes. Over the period, consistently one in five injury victims was reported with unknown place of death, presumably when the person was pronounced dead at the place of injury, such as a highway or worksite, and that place was not classifiable to the categories used with death certificate data.

Discussion. The rapid changes observed in the patterns of place of death in Rhode Island over the past decade reflect changes in the underlying medical care system much more than they reflect changes in the causes of death or the demographics of the decedents. The decline in the number of deaths occurring in acute care hospital inpatient settings and the increase in the number occurring in nursing homes both are related to the rapidly declining length of hospital stays during the decade. (The average stay in acute care general hospitals in Rhode Island fell from 7.4 days in 1989 to 5.1 days in 2000.) Inpatients who can no longer benefit from the treatments available in acute care hospitals are likely to be discharged to nursing homes for their remaining days of life, rather than occupy a valuable inpatient bed.

Similarly, fewer patients die in long-term care hospitals than was true in previous decades. This decrease mirrors the decline in the number of beds, and therefore patients, in these hospitals. Many of these displaced patients will spend their final days in nursing homes, as well.

Finally, fewer patients die en route to emergency medical care than was true earlier, which suggests that more of them reach medical care while alive and still capable of benefiting from it. This improvement likely reflects the increasing variety and sophistication of treatment options that have been adopted by emergency medical technicians over the past decade.

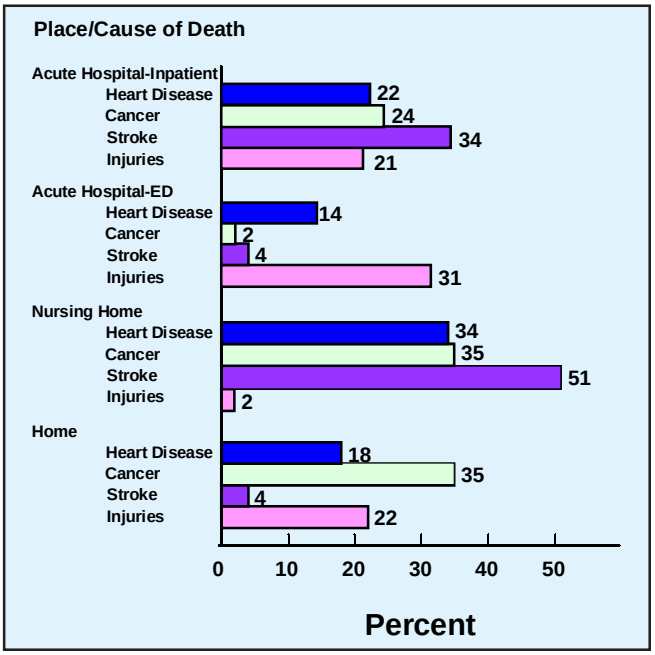

Figure 3. *Place of Death (Selected) by Leading Causes of Death, Deaths Occurring in Rhode Island, 2000.*

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Originally published in the September 2002 issue of Medicine & Health / Rhode Island

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